

Momentum Lab

MATERIALS:

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- * small cart on wheels (about 6 inches long)
- * ramp with sides
- * ring stands to rest ramps on
- * blocks used as barriers to ram carts into
- * various weights
- * meter stick
- * masking tape
- * triple beam balance

OVERVIEW AND PURPOSE

Momentum is a measure of mass in motion. The more momentum an object has, the harder it is to change its motion. The two components that determine the momentum of a moving object are the object's mass and its velocity. Momentum is calculated by multiplying mass times velocity. If either mass or velocity increases, momentum increases.

Momentum, like energy, cannot be created or destroyed. Instead, momentum is transferred from one object to another. When a moving object such as a cart collides with another object, such as a barrier, it can transfer its momentum to the barrier.

In this lab, you will...

- * *design an investigation to test the effects of velocity and mass on the momentum of a moving object*
- * *compare the momentum of different velocities and masses of objects by transferring that momentum into a barrier, causing the barrier to move*

Problem:

How does increasing the mass or velocity of a cart affect the cart's momentum, and therefore the distance the barrier moves on impact?

Hypothesis:

Write a hypothesis to explain the relationship between the momentum of the cart and how far the cart will move the barrier on impact. Your hypothesis should take the form of an "If..., then..., because..." statement.

If the car has less mass then the velocity will increase and the momentum will increase. Because the greater the momentum the farther the block will move.